

## Post Void Residual Reduction by Administering Misoprostol during Post Caesarean Section

**Azami Denas Azinar, Gatut Hardianto**

Department of Obstetrics and Gynecology

Faculty of Medicine, Airlangga University

Dr. Soetomo Hospital Surabaya

### ABSTRACT

Urinary retention, often found in postnatal women, is the inability to evacuate the urine in the bladder. Misoprostol is widely used to induce labor and to manage postnatal bleeding, but it also has another function that is to evoke detrussor muscle contraction. The objective of this study was to determine the effect of misoprostol in Caesarean section on urine retention by measuring residual maternal urine 6 hours after catheter removal. This was a true experimental study, single-blind randomized controlled in Dr. Soetomo Hospital Surabaya on April-May 2013. Subjects were patients with post-Caesarean section were randomly divided into 2 groups. The treatment group was given misoprostol 600 mcg rectally. The control group was not given misoprostol. 24 hours post-Caesarean section the catheter was removed. When the first patient was to urinate after catheter removal, residual urine was measured by catheterization. Analysis showed significant differences in post-void residual ( $p = 0.000$ ). Post-void residual in misoprostol group ( $11 \pm 7.182$  cc) was fewer than that in group not receiving misoprostol ( $43.5 \pm 21.157$  cc). In conclusion, misoprostol reduces post-void residual in post-Caesarean section patients. (MOG 2013;21:104-108)

**Keyword:** Misoprostol, post void residual, Caesarean section, Urinary retention

### ABSTRAK

Retensi urin, sering ditemukan pada wanita setelah melahirkan, adalah ketidakmampuan untuk mengevakuasi urin dalam kandung kemih. Misoprostol banyak digunakan untuk induksi persalinan dan menangani perdarahan setelah melahirkan, tetapi juga memiliki fungsi lain yaitu untuk membangkitkan kontraksi otot detrusor. Tujuan dari penelitian ini adalah untuk mengetahui pengaruh misoprostol terhadap retensi urine pada pasien operasi Caesar dengan mengukur sisa urin 6 jam setelah pengangkatan kateter. Penelitian eksperimental sejati, single-blind randomized controlled di RSUD Dr. Soetomo Surabaya pada April-Mei 2013. Subyek adalah pasien pasca-caesar yang secara acak dibagi menjadi 2 kelompok. Kelompok perlakuan diberikan misoprostol 600 mcg per rektal. Kelompok kontrol tidak diberi misoprostol. Dua-puluh empat jam pasca-caesar kateter dilepas. Ketika pasien pertama buang air kecil setelah kateter dilepas, sisa urin diukur dengan kateterisasi. Kemudian dilakukan uji statistik. Analisis menunjukkan perbedaan signifikan pada sisa urin pasca berkemih ( $p = 0,000$ ). Sisa urin pasca berkemih pada kelompok misoprostol ( $11 \pm 7.182$  cc) lebih sedikit dari sisa urin kelompok yang tidak menerima misoprostol ( $43,5 \pm 21.157$  cc). Disimpulkan bahwa misoprostol mengurangi sisa urin pasca berkemih pada pasien pasca-caesar. (MOG 2013;21:104-108)

**Kata kunci:** Misoprostol, sisa urin pasca berkemih, operasi Caesar, retensi urin

**Correspondence:** Azami Denas Azinar, Department of Obstetrics and Gynecology, Faculty of Medicine, Airlangga University, Dr. Soetomo Hospital Surabaya

### INTRODUCTION

Urinary retention is the inability to evacuate the urine in the bladder. It is often found in postnatal women and postoperative. The exact number prevalence of urinary retention in women is not certain because many cases are not reported acute urinary retention. The prevalence of bladder emptying disorders caused chronic urinary retention ranges from 13-26%. Retention of urine occurs in 10-15% of patients postnatal.<sup>1,2</sup> Anamnesis, physical examination and some investigations can diagnose most cases of urinary retention. Early treatment will prevent

further complications. Measurement of post void residual 6 hours postnatal or 6 hours after removing the catheter that can be used for early detection of urinary retention. Catheterization or ultrasound is a simple act measuring residual.<sup>3,4</sup>

Prolonged urinary retention that undertreatment will cause complications of recurrent urinary tract infection and reflux into the ureter which can damage the upper urinary tract and even the incident of kidney failure. Difficulty of detection of urinary retention due to fear of postnatal patients urinary complain for fear of

prolonged hospital care and patient ignorance about the symptoms and dangers of urine retention.<sup>5,6</sup>

Caesarean section delivery method will be done if vaginal delivery is not possible. Manipulation of the bladder when caesarean section is allegedly to cause weakening of the detrusor muscle contraction.<sup>7</sup> Prostaglandins play a role in the increased contraction of the detrusor muscle. Prostaglandin E1, prostaglandin E2, prostaglandin is prostaglandin F2 that works to increase the contraction of the detrusor muscle.<sup>8</sup>

Advantages prostaglandin misoprostol compared to other compounds is low cost, long half-life, is not affected temperature and is widely available in many countries. Another advantage compared to other uterotonic drugs such as oxytocin is not require special skills and equipment (syringes).<sup>9,10</sup>

The use of misoprostol in the field of obstetrics and gynecology is used to induce labor, postnatal bleeding. Another function of misoprostol is to evoke detrusor muscle contraction. Misoprostol can make  $Ca^{2+}$  channels open so the extra cells will easily fit into the intra-cell and binds to calmodulin which activates the formation of MLC kinase that facilitates the formation of P-Myosin Myosin which then binds to actin to cause contraction of the detrusor muscle contractions.<sup>11</sup>

The study was to determine the effect of misoprostol on Caesarean section operations against the retention of urine by measuring residual maternal urine 6 hours after the catheter is removed.

## MATERIALS AND METHODS

This research was true experimental research with post-test only control group design conducted single blind in women undergoing Caesarean section. The research was conducted in dr Soetomo hospital in April-May 2013.

Subjects were patients with post-Caesarean section were randomly divided into 2 groups. The treatment group was given misoprostol 600 mcg per rectal. The control group that was not given misoprostol. Inclusion criteria for this study of patients with post-caesarean low segment incision, emergency or elective surgery with skin incision phanensteil, regional anesthesia (Sub arachnoid block). Exclusion criteria for this study were any signs of infection, urinary tract infection before trans-urethral catheter, severe preeclampsia, diabetes mellitus, renal dysfunction, difficult urination disorders before trans-urethral catheter, prolonged second stage neglected labor, twice or more previous Caesarean,

factors that can affect fetal uterine contractions as much (hydramnios or polyhydramnios), twins, got misoprostol prior to induction of labor. While the criteria are spending occurred complications such as Caesarean section is not a good contraction, bladder injury in the operation that need further action, such as complications after caesarean section wound infections, urinary tract infections after Caesarean section.

Misoprostol given after Caesarean section before exiting the operating room. 24 hours post-Caesarean section catheter removed. After the first patient to urinate after the catheter off post void residual measurement method catheter female catheterization with no 12.

To see the difference in post void residual in the misoprostol group and without misoprostol first tested for normality with the Shapiro Wilk, when normal distribution using the unpaired t test, when abnormal distribution will be made non-parametric test Mann-Whitney. To facilitate statistical calculations will be used SPSS software tools.

In this study, using a significance level of 0.05 (5%), so if the statistical test obtained  $p < 0.05$  can be said to be significant, whereas when  $p > 0.05$  say is meaningless.

## RESULTS AND DISCUSSION

Table 1. Characteristics of patients based on age, birth weight, body mass index, parity, indication

VARIABLE	GROUP	
	WITHOUT MISOPROSTOL (N=20)	MISOPROSTOL (N=20)
AGE, YEARS	28,30 ± 6,359	30,55 ± 4,872
BABY BIRTH		
WEIGHT, GRAM	2920 ± 516,669	2895 ± 411,959
BMI, KG/M <sup>2</sup>	23.4 ± 0,75	23,69 ± 0,91
PARITY		
Primigravida	8	8
Multigravida	12	12
INDICATION		
Secondary arrest	7	9
Abnormal NST	6	3
Tranverse lie	0	1
Severe oligohidramnion	3	4
PROM previous caesarean	1	1
PROM breech presentation	3	1
High myopia	1	0

During the period of this study, 40 samples, which consist of 20 samples was given misoprostol 600 mcg rectally group. and the same amount from was not given misoprostol group. Table 1. Showed that the difference age, birth weight, body mass index, parity, indication caesarean section. The age of the youngest

mothers in the misoprostol group 21 years and the oldest 40 years of age, with a mean age of 30.55 years. While the group did not receive misoprostol youngest mother aged 20 years and the oldest 42 years of age, with the mean age of 28.30 years. There is no significant difference in both groups

Smallest birth weight infants in the misoprostol group 2100 grams and 3400 grams of the biggest, with the average birth weight 2895 grams. While the group did not receive misoprostol smallest birth weight 2000 grams and 3800 grams of the biggest, with the mean birth weight 2920 grams. There is no significant difference in both groups

Based on the parity, in the misoprostol group, 60% of them multigravid, and the remaining 40% primigravida. While in the misoprostol group that did not receive as much as 60% of them multigravid and the remaining 40% primigravida. There is no significant difference in both groups

Sample characteristics indicative highest Caesarean section in both groups secondary arrest; misoprostol group as much as 45%, whereas in the misoprostol group that did not receive as much as 35%. Indications of Caesarean section at least in the misoprostol group, namely latitude, previous caesarean section premature rupture of membrane, breech presentation and high myopia as much as 5%, while the group that did not receive misoprostol premature rupture of membrane previous caesarean section 5%. There is no significant difference in both groups

Smallest body mass index of 19.5 kg/m<sup>2</sup> in the misoprostol group and the largest 34.1 kg/m<sup>2</sup>, with a mean body mass index of 23.69. While the group did not receive misoprostol smallest body mass index of 19.5 kg/m<sup>2</sup> and 31.5 kg/m<sup>2</sup>, with a mean body mass index of 23.4 at. There is no significant difference in both groups

The parameters examined in this study is the first time the distance urinary catheter off, the amount of urine the first time off the catheter, and post void residual (Table 2). distance urinary catheter first with loose, the amount of urine the first time off the catheter does not influence the occurrence of urinary retention. post void residual is one marker used for the diagnosis of urinary retention. Based on the definition of urinary retention absence of spontaneous voiding process 6 hours after the catheter is removed and settled or can be spontaneous voiding with residual urine > 200 ml. It can be concluded there is no urine retention events in this study in both groups.

Table 2. First time the distance urinary catheter off, the amount of urine the first time off the catheter, and post void residual

VARIABLE	MEAN±SD		p
	WITHOUT MISOPROSTOL	MISOPROSTOL	
TIME URINATION (HOURS)	4,35±1,04	3,55 ± 0,826	0,01
AMOUNT URINATION (cc)	310±55,521	360 ± 95,422	0,051
POST VOID RESIDUAL (cc)	43,5±21,157	11 ± 7,182	0,000

From the results of homogeneity test characteristics of the study sample by maternal age., parity, birth weight and cesarean indication, body mass index obtained  $p > 0.05$ . It shows that the characteristics of the study sample based on maternal age, parity, birth weight and cesarean indication, body mass index no significant difference.

Distance urinary catheter was first off the show with a return to normal urinary function after surgery section sesarea.<sup>1</sup> Role misoprostol induce detrusor muscle contraction theoretically make faster restore micturition function so that when the catheter to urinate after taking misoprostol is expected to be faster.

In this study, the statistical test results obtained within the first urinary catheter with a loose group compared misoprostol misoprostol group received no significant difference ( $p < 0.05$ ), which found the average distance to the first urinary catheter off shorter in the misoprostol group  $3.55 \pm 0.826$  hours compared to  $4.35 \pm 1.04$  hours in the group did not receive misoprostol. Distance urinary catheter off the first time with the misoprostol up to 6 hours at least 3 hours. Whereas in the group without misoprostol maximum of 6 hours and a minimum of 3 hours.

Misoprostol cause Ca<sup>2+</sup> channels open so that the extra-cellular Ca<sup>2+</sup> will easily fit into the intra-cell and binds to calmodulin which activates MLC kinase formation that will facilitate the formation of P-Myosin Myosin which then binds to actin to cause contraction of the detrusor muscle. Detrusor muscle contractions that lead to back good bladder function returned to normal so quickly emptying of bladder function to be good and the distance to the first urinary catheter becomes faster.<sup>11</sup>

Weakness variable inspection time urination is there a difference in conditions such as differences in room atmosphere, the climate of the day to cold conditions can trigger the sensation to urinate faster. Pain after

surgery to make patients afraid to contract the abdominal muscles so that the muscles do not contract the detrusor voiding sensation eventually become slower. Pain also make patients afraid to urinate so that patients hold urine. These things make measurements of these variables to be biased but not great as the difference in mean voiding time significant and random sampling indicates the condition has no effect.

Amount of urine during urination first to show the capacity of the bladder. Normal bladder capacity about 300-500 cc. Misoprostol increased detrusor muscle contractions can affect bladder function is charging.<sup>1</sup> Amount when first voiding urine in this study showed statistical test to the amount of urine during urination first time after taking the misoprostol group compared catheter group did not receive misoprostol did not differ significantly ( $p > 0.05$ ), which obtained the average amount of urine during urination first times after taking a catheter in the misoprostol group compared with  $360 \pm 95.422$  cc with  $310 \pm 55.521$  cc in the group did not receive misoprostol. Amount of urine voiding first time after taking misoprostol catheter at least 200 cc up to 500 cc. Whereas in the group without misoprostol maximum of 400 cc and 200 cc minimum.

Based on the physiology of micturition, which plays a role in the return of bladder function is the function of the bladder filling. Where the filling phase of the bladder and urethral sphincter contraction in detrusor muscle relaxation. Misoprostol function here opposite the detrusor muscle contraction increases so does not affect the function of the bladder filling. Here rehydration bigger role than giving misoprostol. Patient instructed to drink a minimum of 125 cc per hour but no definite patient drink volume was measured every hour so make measurement biased is a big variable.

Examination one marker of the retained urine. Post void residual  $> 200$ cc in action obstetrics and  $> 100$  cc at a gynecology actions urine retention. Misoprostol is expected to increase the detrusor muscle contractions that function better emptying of the bladder, post void residual on misoprostol to be a little.<sup>1</sup>

In this study, statistical tests showed the Post void residual in the misoprostol group compared misoprostol group received no significant difference ( $p < 0.05$ ), which obtained a mean Post void residual in the misoprostol group  $11 \pm 7.182$  cc with  $21.157 \pm 43.5$  cc compared to the group not received misoprostol. Post void residual on misoprostol up to 30 cc at least 5 cc. Whereas in the group without misoprostol maximum of 80 cc and 15 cc minimum.

Urine affected residues detrusor muscle contraction. Physiology of micturition, bladder emptying function that makes both the less Post void residual. Misoprostol including PGE1 causes  $Ca^{2+}$  channels open so that the extra-cellular  $Ca^{2+}$  will easily fit into the intra-cell and binds to calmodulin which activates the formation of MLC kinase that facilitates the formation of P-Myosin Myosin which then binds to actin to cause contraction of the detrusor muscle. Detrusor muscle contractions cause urinary function improved emptying and cause post void residual and urinary retention risk is reduced.<sup>11</sup>

Variable post void residual examination weakness that there are differences in conditions such as differences in the atmosphere in the room. Pain after surgery to make patients afraid to contract the abdominal muscles so also do not contract the detrusor muscle that spending is not perfect and post void residual urine becomes more so the measurement of the variables to be biased but not great because the mean difference significant Post void residual indicates the condition of no effect.

## CONCLUSION

Misoprostol after Caesarean section lowers post void residual so that the likelihood of urinary retention after cesarean also declined. Misoprostol after caesarean section may be recommended as an addition to the Caesarean section procedures because in addition to preventing postnatal bleeding also to prevent postnatal urinary retention

## REFERENCES

1. Junisaf, Santoso Iman B. Buku Ajar Uroginekologi Indonesia Jakarta. Himpunan Uroginekologi Indonesia. 2011
2. Lim JL. Post-partum voiding dysfunction and urinary retention. The Australian & New Zealand journal of obstetrics & gynaecology. 2010;50(6). p. 502-5
3. Haylen BT, Lee J. The accuracy of post-void residual measurement in women. International urogynecology journal and pelvic floor dysfunction. 2008;19(5). p. 1603-6
4. Haylen BT, Lee J, Logan V, Husselbee S, Zhou J, Law M. Immediate postvoid residual volumes in women with symptoms of pelvic floor dysfunction. Obstetrics and gynecology. 2008;111(6). p. 1305-12

5. Saultz JW, Toffler WL, Shackles JY. Postpartum urinary retention. *The Journal of the American Board of Family Practice / American Board of Family Practice.* 1991;4(5). p. 341-4
6. Ching-Chung L, Shuenn-Dhy C, Ling-Hong T, Ching-Chang H, Chao-Lun C, Po-Jen C. Postpartum urinary retention: assessment of contributing factors and long-term clinical impact. *The Australian & New Zealand journal of obstetrics & gynaecology.* 2002;42(4). p. 365-8
7. Liang C, Chang S, Chang D, et all. Postpartum urinary retention after cesarean delivery. *International Journal of Gynecology and Obstetrics.* 2007;99. p. 229-232
8. Ulmstein U. Prostagandins and TheUrinary Tract. *Acta Obstet GynecolScand Suppl.* 1983;113. p.55-58
9. Tang O, Danielsson K, Ho P. Misoprostol: Pharmacokinetic profiles, effects on the uterus and side-effects. *Int JGynecol Obstet.* 2007;99. p. S160-S167
10. Zeteroglu S, Sahin HG, Sahin HA. Induction of labor in great grandmultipara with misoprostol. *Eur Jof Obstet Gynecol Reprod Biol.* 2006;126. p. 27-32
11. Anderson K, Arner A. Urinary Bladder Contraction and Relaxation: Physiology and Pathophysiology. *American Physiological Society. Physiol Rev.* 2004;84. p. 935-986